N.A.C.A. BULLETIN

In Two Sections

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EDITORIAL DEPARTMENT NOTE

The first article in this issue of the *Bulletin* completes a series of three on special uses of cost data. "Costs for Management Decisions" by Everett M. Hicks appeared in the August 1 issue and "Costs for Planning Purposes" by Walter A. Holt in the August 15 issue. The article by Mr. Miller in this issue both complements and supplements the two earlier ones.

W. WESLEY MILLER, the author of this article, has been engaged during the past sixteen years in both public and industrial accounting. He was recently appointed Works Accountant for the Atha Works, Crucible Steel Co. of America. Author of much of the text material for the ESMWT courses sponsored by the Newark College of Engineering, Mr. Miller served as instructor at the college and at Rutgers University during the war. Mr. Miller has been active in the management of the Newark Chapter, serving last year as Director of Education and currently as Chapter Secretary.

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At the Eighth International Management Conference held in Stockholm last July, a section on Cost and Budgetary Control was devoted to a consideration of five papers by representatives of the United States, Great Britain, Denmark, Norway, and Holland. The American paper, dealing with "Progress in Cost Control," prepared by Wyman P. Fiske, was a report of progress in cost control in this country, based on a growing concept of the accounting function and a study of the problems of management to which accounting can contribute as a tool of analysis and interpretation. We are sure readers of the *Bulletin* will be interested in the resume of progress made in recent years.

WYMAN P. FISKE, a Past President and Past Secretary of the Association, needs no introduction to N.A.C.A. members. His contributions to the industrial accounting field as a teacher, writer, speaker and officer of N.A.C.A. are well known. Mr. Fiske served as National President of N.A.C.A. for 1942-1943 and as National Secretary during 1945 and 1946. Since November 1946 he has been practicing as Management Consultant, with offices in New York City.

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There is an inclination on the part of some to feel that many of the techniques which are used in connection with factory cost control are not equally applicable to clerical operations in the office. It is undoubtedly true that the problem is more difficult, but the principles and techniques are much the same, and the possibilities for saving in this day of increasing paper work and clerical salaries are great. The third article in this issue of the *Bulletin* provides a clear exposition of methods which have been successful in this area.

H. F. VAN GORDER, the author of this article, spent thirteen years with the International Business Machines Corp. as Consumer Engineer, Salesman, and Branch Office Manager, following the completion of his formal education in business administration. For six years, beginning in 1938, he served as Procedure Supervisor with National Tube Co., a subsidiary of the U. S. Steel Corp., and in 1942 was promoted to Procedure Supervisor of the U. S. Steel Corp. of Delaware. In this position he is responsible for the improvement of procedures of all subsidiaries in the U. S. Steel family.

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SEPTEMBER 15, 1947

COSTS FOR PLANS AND POLICIES

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THE PRIME requisite of any business, if it is to be a profitable enterprise, is good management. We generally refer to management in a rather limited sense by thinking of a small group of executives who plan and control the operations of a business. This group is frequently faced with the necessity of deciding upon a specific course of action in connection with the formulation of plans and policies. Such decisions are not a mere question of "to do or not to do," but frequently involve a consideration of alternative courses of action and the choice of that one which will produce the desired results. This presents a problem, the answer to which often depends wholly or in part upon cost information properly prepared and presented by the industrial accountant. It is the purpose of this paper to consider the special types of cost data required by management when confronted with the problem of alternative courses of action. It is not my purpose to answer the problem, but to indicate the kind of data which will help management in making a decision.

Sources of Information

The industrial accountant has at his command many sources of information, among which are projected budgets, current standards, and recorded costs of past performance. To these may be added estimates based on engineering data, and statistical information from outside sources. Cost data may be used for a variety of purposes, but it is a well-known fact that the same cost information will not serve every purpose. Therefore, before any figures are prepared it is necessary to have a clear understanding of the uses to which they will be put. This necessitates a preliminary conference with the management for the purpose of obtaining as complete information as possible concerning the end use of the data, the desired results, and the possible courses of action which will produce these results. This is essential to the proper preparation of cost data for special purposes, and is the first step in putting cost accounting to work.

The Criteria

Before considering specific cases, I would like to establish a premise by setting forth a concept of the relationship between investment and return, or, to state it in another way, cost and its related income. We often hear it said that "you have to spend money to make money." When management decides to pursue a course of action which entails the outlay of cash, attention is focused on the benefits to be derived from such an expenditure. Every dollar required to carry out a decision is spent for the ultimate purpose of obtaining a revenue in excess of the investment. Where alternative courses of action are open to management, the basic factor in making a decision is the measure of profit involved. Consequently, a mere comparison of costs is of little value. The real significance lies in the relationship between the cost of each plan and its respective income-producing probabilities. The importance of this point cannot be overemphasized, and I urge that these comparative relationships be kept in mind at all times, and that they be developed from the viewpoint of long-range application rather than their immediate or current aspects.

Make or Buy

Let us consider the question of whether to make or buy. This may resolve itself into any one of several situations. For example, a company may be considering whether to make or buy something which it has never before required, or it may be questioning the advisability of making some component part which has heretofore been purchased, or of buying something which it is now making. There are still other ways in which this question may be presented, such as making a component part and allowing an outside vendor to partially process the item; or buying an item and exercising control over some phase of the vendor's work. However, regardless of the manner in which this problem is presented, the question is how to obtain a specific item in such quantities and at such times as required by production schedules, at a cost which will permit a profitable turnover.

This brings us to the first step in preparing our report to management, namely, that of ascertaining all the pertinent facts which will have a bearing on costs. Some of the questions which will have to be answered are as follows:

1. What are the specifications of the item in question, particularly with regard to material analysis, size and dimen-

sions, quality, special methods of manufacture, and ultimate use?

2. What quantity is required during a given period of time, and what delivery schedule must be maintained?
3. What are the sources of supply and vendors' prices for purchased items, or for raw materials required to manufacture the part?
4. What facilities are available for making the item, and what additions or changes, if any, will be necessary?

These are a few of the questions which will have to be answered for the accountant by those whose function relates to engineering, production, and purchasing. When we have obtained this information, and whatever additional data is pertinent, we can proceed with the preparation of the cost figures.

Total Costs vs. Unit Costs

Our objective is to present a picture of the cost to make, as compared with the cost to buy. In the broad sense, this means the cost to make or buy a given number of units over a specific period of time. This means total cost for it is the only sound basis for comparing alternative methods. Such a comparison will enable management to visualize the long-range profit potentials in dollars and cents, and this, in the final analysis, is the essence of operating results. Unit costs are affected by volume levels. Their use, therefore, should be restricted to those cases where the underlying conditions will remain unchanged throughout the period under consideration. However, if management prefers the presentation to be made in terms of unit costs, they should be derived only after total costs have been computed for the volume required. In other words, unit costs may be employed to express the results, but should not be used as the basis of the cost calculations.

Inventory Cost vs. Out-of-Pocket Cost

In considering the cost to make, there are several methods by which to calculate the total cost. Before selecting a method, we must have a clear definition of cost. On the one hand, cost may be defined as the cost which attaches to the produced article at its completion—in other words, the inventory cost. Under this concept of cost, we would select a method which takes into account all the costs involved, such as that of material, labor, direct burden, and factory overhead. On the other hand, management's concept of cost might embrace only the additional out-of-pocket expenses

which will be incurred in making or buying. If management thinks of cost in this way, we must select a method which recognizes only those items which represent additional outlay over and above those costs which would normally be incurred regardless of whether the item is manufactured or purchased. This latter method requires a division of costs into prime, fixed, and variable categories. Those which are fixed may be omitted from the calculation, and if the presentation is made on this basis, the accountant should call attention to the fact that the anticipated resulting margin between the so-called cost and the revenue value of the article represents a recovery of factory overhead charges which, otherwise, would have to be absorbed by the profits from other products. I feel very strongly that a presentation made in this manner should be amplified by showing that portion of the existing fixed charges which are applicable to the production or purchase of the item in question, and which would be included in the actual cost records if and when production takes place. When we include the fixed charges in the cost to make, we must likewise include them in the cost to buy; otherwise, the resulting comparison will not be correct. In order to avoid a misunderstanding of this point I wish to indicate that the fixed charges included in the cost to make are not identical with those included in the cost to buy. For example, we would include in the cost to make such fixed charges as depreciation on equipment, rent, property taxes, etc., such as would normally be charged against the production of this item and included in its ultimate inventory cost. In the cost to buy we should include such fixed charges as purchasing department expense, receiving expense, etc. These fixed charges exist regardless of whether we make, buy, or refrain from doing either. They do not constitute an additional cost of making or buying, but if management decides to make or buy, the ultimate inventory cost of the item will be charged with a portion of these expenses. The danger in this latter method lies in the separation of the fixed and the variable costs. Any separation, whether it be well-considered or arbitrary, is subject to change over a period of time. Because of this fact, I am inclined to favor the method first mentioned, where all costs are compared.

Significance of Future Production Schedules

Inasmuch as we are considering costs which relate to a future period, we must also take into consideration any known or reason-

ably expected changes in the prices of material and labor. We must also relate the required production and delivery schedules to those which have been determined for other products. This latter task must be referred to the production department, but the accountant should incorporate their findings in his presentation.

Question of New Equipment

One other point in connection with make-or-buy problems is that of the machinery and equipment which would be required to make the item in question. The accountant should investigate thoroughly the possibility of any necessary changes in existing equipment, and whether or not new equipment will be required. The cost of making changes in existing equipment, as well as the purchase price and installation costs of new equipment, are definitely a part of the cost to make, and should be properly allocated to the units produced. If any part of the processing is to be done on equipment which would otherwise remain idle, this should likewise be taken into consideration. Depreciation on idle equipment is not an additional cost, but will eventually become a part of the cost to make when calculating actual costs.

Depreciation on Fully Depreciated Assets

Another question which has caused much controversy is whether or not depreciation on fully depreciated assets constitutes an item of cost. I believe the answer to this depends on whether or not the article to be produced is a staple product which will continue to be made beyond the period of the present equipment's useful life. If it is not, I would omit such depreciation from the cost calculation, and merely mention it in a footnote. However, if long-range production is contemplated, I would consider the question of replacement cost and its effect on the cost of production at that time as compared with the present. In any event, I do not suggest the inclusion of such depreciation expense in the data as a bona fide cost, but rather as an observation worthy of management's consideration. All of these factors have a definite bearing on costs and their effect must be considered.

I have no conviction regarding the proper anwser to the make-or-buy question. I can only state that the answer will depend upon the conditions known or assumed, and the benefits to be derived, both tangible and intangible. It is not within the province of the industrial accountant to decide the question but he should use

every resource at his command to provide the kind of data which will enable management to make the right decision.

Replacing Equipment

The next question for consideration is that of replacing existing machinery with improved equipment. The change may be contemplated for the purpose of obtaining greater output, or it may be prompted by the need for reducing manufacturing costs without any intent to increase the salable output. Here again, the comparison of costs to be incurred must be related to the expected income. In preparing a cost report on the question of replacement, I would arrange the data so as to show two things: first, the current out-of-pocket costs, and second, the long-range profit potentials for each of the alternative courses of action. The reason for a two-fold approach lies in the fact that management must first concern itself with the funds required to purchase and install the new equipment, and then must justify the investment in the light of its effect upon future operating results.

The accountant must show how much it will cost to replace the existing equipment, and how much can be expected in annual profits as a result of using the new equipment, as compared to the profits expected from present facilities. The first item, which I shall call the investment cost, includes the following:

1. Cost of the new equipment, including freight and installation costs.
2. Cost of removing the present equipment, less the net amount realizable from disposal or sale.
3. Cost of rearranging power lines and other equipment. This may be necessary in order to accommodate the new equipment.

Each item should be shown in detail, so that management has a clear picture of all the costs and how they were calculated. Taken collectively, they represent the out-of-pocket investment for which funds must be provided. But let us not stop at this point, for there are intangible items which, although they do not call for cash outlay, are just as much a part of the investment as those mentioned above. For example, there is unamortized value of the present equipment. This must eventually be charged against income, either immediately or over a period of time. Items of this nature should be brought out by the accountant and called to the attention of the management.

Consideration of Profit Potentials

Now let us look at the profit potentials. We must be careful not to overlook any factors which will affect future earnings. The general tendency might be to present a comparison of production costs using both the present and the new equipment, based on expected operating costs in relation to the respective output of each machine. It is true that such a presentation would show the savings, if any, which would result. But this is not the proper way to handle the matter. I insist that the only true picture is that one which reflects expected profits. Suppose a comparison of costs showed that the use of present equipment would result in producing 10,000 units at a total cost of $10,000 and that by replacing the existing equipment with more modern machinery we could produce 50,000 units at a total cost of $25,000. The indication is that unit costs can be cut in half by the use of new equipment. But what happens if we have a market for only 10,000 units? Will the new machinery stand idle 80 per cent of the time, and if so, what effect will the unabsorbed fixed charges have on the indicated savings? These points must be considered and I would emphasize that we should not feature the savings in production costs alone, but should play up the annual profit picture and take a separate observation regarding the savings in production costs, based on the expectation of selling a given number of units.

In order to present this kind of a picture, the accountant should first ascertain the number of units which will be required during the year. By relating this to the productivity of both the present and new equipment he will show the productive hours required. On this basis he will calculate and show in comparative form the expected costs of labor, supplies, power, depreciation, and other allocable overhead costs, including maintenance, all on an annual basis. If the productivity of the new machine is greater than the required output, the unabsorbed fixed charges will thus be taken into consideration, and the extent to which they are included should be stated, so that management is made aware of the fact, and it should also be indicated that there is a possibility of creating a greater profit if the new machine can be employed on other work during the standby time.

Other Considerations

Another item to consider is that of material costs. For example, if we are dealing with a screw machine which uses stock lengths

in the feed tubes, it may be that the new machine requires less material in the basic feed length. Hence the size of butt ends would be reduced, thereby resulting in a decrease in material costs.

One other item to which I have previously called attention is that of the unamortized value of the old equipment. This should be shown as part of the annual cost allocable to the new equipment. As stated before, it will have to be disposed of as a charge against earnings, and should be covered in the presentation.

There are many aspects of the question of replacement, and considering the uncertainties of the future, the accountant can hardly be expected to cover every contingency. However, by careful investigation of the matters relating to investment, productive output, marketing limits, and operating costs, and by careful assembling of data, he can present a report to management which will show the required investment and its effect on annual profits. Management can then determine the time required for the new equipment to pay for itself, and will have a fair data on the financial risks involved.

Business at a Special Price

The final question for discussion is that of accepting or rejecting business at a special price. This question usually arises when a company wishes to utilize vacant space by making an additional product, or it may come from a desire to avoid idle plant costs where limited production requirements result in a periodic shutdown of certain equipment. For purposes of this discussion, it is assumed that the business relates to a different product than that customarily made. Suppose, then, that we rephrase the problem as "shall we make a new product and sell it below cost?" At the outset, it would appear unsound to accept any business which does not result in a profit, but if we bear in mind that profit is the result of the cost price relationship, and if we look at this relationship in its over-all aspect, we can prepare cost data for management which will be truly informative. Our real problem, then, is to prepare a statement of costs which will reflect the lowest dollar value at which the product can be sold without sustaining a loss. This problem is not the same one with which we are confronted in the determination of selling prices for regular line products, for it is to be assumed that production and sales of such products will not be affected by the introduction of the new product.

Let us see, then, what goes into the figure we commonly call "cost." First, we have the prime cost, that of direct materials and direct labor. To this we add factory overhead, then administrative and selling expenses. In any case, we must all agree that the prime cost is an out-of-pocket item. The factory overhead, however, is of a different nature. It is made up of fixed and variable items. I would like to depart from this terminology and say that factory overhead consists of cash costs and noncash costs. This helps in making a separation, as we should be able to pick out of the forecast overhead those items which will arise as a result of direct spending for the new product. These are the cash costs, which will be added to the prime costs. Next we come to the administrative expense, which I assume will not be affected regardless of the ultimate decision. We can, therefore, pass on to the selling expenses. Here again, we must pick out the cash costs. To do this we must obtain information regarding the expected costs of marketing the new product. This is one of the points to be covered in the preliminary conference with management and will have to be answered by the sales executive.

When the cash costs thus have been separated, the true out-of-pocket expenditures can be set up as representing the lowest point of comparison with the selling price. Now the accountant can go back and accumulate the noncash costs applicable to the new product. When these are added to the cash cost, we obtain what would be considered the normal cost. It is extremely important that the presentation be prepared in this manner for we must point out to management the extent to which special pricing may be safely carried. The point I wish to make here is that if specially priced business oversteps certain limits, it can cut into the plant capacity which has been set up in the basic budget as allocable to other products. If this takes place, the output of these products is reduced and a certain amount of the fixed costs which prevail regardless of the volume of production, and which have been allocated to other products, will then apply to the new product. As a result, the original cost-price relationship is upset, and what may have appeared to be a justifiable decision will turn out to be the reverse. The accountant must therefore prepare his data with definite limits in mind, and these should be shown in the presentation. In this respect, a properly designed basic budget is invaluable as it will show the amount of overhead which must be absorbed by normal capacity output. Unabsorbed costs have no place in such a budget,

so that it may be used in determining both the minimum normal burden rate and the effect of varying production levels. If an increased output of the new product causes the volume levels of other products to change downward, the basic budget is the surest guide in determining the effect of such changes on the new product and the over-all profit picture.

This is a concept of cost which permits a separation of cash costs and noncash costs, the sum of these representing the total or book cost. With this separation, it is obvious that the true cost-price relationship will be expressed, and that if the price obtainable is lower than the cash or out-of-pocket cost, the folly of accepting the business will be demonstrated. However, if the price exceeds the cash cost, the margin is a profit when taken as part of the over-all operating results, and the only remaining factors to be considered are the volume limitations within which this special business must be confined, and the possible lasting effect on the pricing policy of the company.

Conclusion

I have presented a general picture of the special types of cost data required when management has a choice of alternative courses of action. In conclusion, I wish to state that the industrial accountant, in preparing this data, must cover the following points:

1. He must confer with management and obtain as much information as possible regarding the objective, its requirements, and the possible courses of action open for consideration.
2. He must have a clear concept of the meaning of cost as it applies to the specific problem at hand.
3. The cost presented must relate to a definite future period and be based on facts or assumptions which have been thoroughly investigated.
4. The advantages and disadvantages of each course of action must be set forth for consideration.
5. The long-range aspect of profit must be the keynote of the presentation.

By observing these points and incorporating them in his presentation, the accountant will have accomplished much toward discharging his obligation. He should not try to decide the problem for management, but should furnish adequate and proper cost data and let management decide for itself.

DEVELOPMENTS IN COST CONTROL

by WYMAN P. FISKE
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COST ANALYSIS as a management tool has shown a steady and rapid rate of development for nearly half a century, with the later years showing particular progress. Perhaps the outstanding characteristic of this development has been an ever-widening field of use of the tool as new problems have been raised by changing economic and business conditions. The first impetus arose from the primary need for accounting data as a basis for determination of inventory valuations and of profit amounts. The increasing importance and complexity of manufacturing required the development of special techniques for the allocation of costs to particular products and to units of product, if reliable measures of annual profits were to be possible. Where sound business judgment had not already brought about the adoption of more defensible and refined methods, income and business excise taxes forced some approach to the problem. The usefulness of the new data in the control of manufacturing operations was recognized very early by those interested in improving the quality of management. Narrowing profit margins and the depression conditions of the thirties resulted in greatly extending the use and effectiveness of cost analysis for control of costs and operations. Similarly, as government extended its activities in the direction of closer control and regulation of the social and economic activities of the nation, there were increasing demands for more factual information to support regulatory decisions. Business, on its part, found new studies necessary to defend actual or proposed steps and decisions.

Conditions Prior to World War II

The beginning of the period under review (1936-1947) found cost analysis firmly established as a tool of management but with the extent and effectiveness of its use varying widely from industry to industry and from company to company. Most large, and many small, enterprises were depending on cost and value figures developed by cost accounting. On the other hand, altogether too many businesses still kept no cost records worthy of the name, and the effectiveness of the methods used by others was too often

open to question. Most of the basic technical problems of cost allocation had been thoroughly debated. There was general agreement as to the essential principles and techniques. Differences of opinion and variations in practice were largely limited to details of applicability and degree of refinement called for by operating conditions.

In the years just prior to the opening of the period, spectacular progress had been made in the use of cost data for control of costs and operations. The movement began many years earlier, but dire necessity forced concentrated attention on the rapid further development of principles and techniques which might help in getting and keeping costs under control. By 1938 much had been written and more had been done on different aspects of controlling costs and operations, though there was as yet little in the way of complete and comprehensive discussion of those basic management principles underlying successful control. Standard cost techniques were in wide, but not general, use and analysis of variances was a recognized tool. Budgets had been extended from their original planning objective to use as a control device. The extreme fluctuations in the level of manufacturing operations had directed attention (1) to the reaction of different cost elements to variations in volume, and (2) to the validity of budgets or standards developed for markedly different levels. From the concept of flexible or variable standards and budgets an answer was worked out. In practice the application of this concept ranged from a series of budgets or standards, each related to a particular level of operation, to variability formulae applied to a basic budget or standard.

The passage of the Robinson-Patman price discrimination legislation in 1936 had also given a new emphasis to analysis of distribution costs and to use of cost data as a basis for legally defensible prices. Thus both distribution costs and pricing received wider attention than had been the case prior to the passage of this act.

The War Years

All of these conditions existed at the beginning of the period under consideration. Progress was being made in every direction. The period had barely begun, however, before the war years were with us. While the United States did not become an active belligerent until December 1941, there were immediate effects upon industry and cost accounting of steps first to aid the western,

and then the Russian, allies and then to make our own preparations for the obviously inevitable belligerent phase. The Government became the principal, and in many cases the sole, customer of manufacturing industry. Controls were instituted over both war and civilian activities, including prices. Industrial accounting was presented with an entirely new set of problems.

The many forms of contracts for defense and war production raised a variety of costing problems. Costing of particular contracts and allocations of costs between defense and nondefense activities became necessary. Allowable costs under War and Navy Department regulations took precedence over industry practice. Substantial investments were made in production facilities, the use of which was either probably or certainly limited to the war period. Income tax legislation was amended to permit amortization of such facilities at extraordinary rates. Regular buildings and equipment were used around the clock under conditions which made anything approaching normal repairs impossible. Accelerated depreciation became necessary only a few years after depression conditions had encouraged write-downs of capital values as a means of decreasing depreciation charges.

A national determination to avoid unreasonable war profits led to an early enactment of legislation providing for a review and renegotiation of prices and profit margins. Accountants provided a considerable proportion of the largely civilian personnel of the boards organized to administer legislation. Accounting data played an important part in the reviews. Similarly, accountants and accounting data were closely concerned with all the other regulatory requirements and procedures engendered by the war. Price controls as a basis for avoidance of inflation reached every business, whether it was concerned with military or nonmilitary production or distribution.

All these changes were admittedly temporary, for it was clear from the start that the nation accepted tight regulation only as a wartime necessity and intended to be relieved of it as soon as possible after victory. Other changes, however, of possible longer-term effect resulted which were intangible and less obvious. Accounting organizations, particularly at the supervisory and policy levels, were decimated as the result of military manpower requirements. Much of the best experience and intelligence went into military or government service. Then demands for accounting

data ballooned when volume rose to incredible heights and different agencies of the government began to call for information as a basis for regulatory activities. Men remaining behind were given responsibilities generally beyond their experience and too often beyond their capacities. Inadequate training characterized new recruits. Under pressure of necessity many normal activities of control and planning nature were curtailed or abandoned in order to get out essential financial and government reports. Accounting organizations deteriorated in training, experience, and point of view. Emphasis was upon mechanical production of data rather than upon use of cost information and reports as a tool to increase effectiveness of operations. With a similar deterioration of production and sales organizations as far as the problems of competitive manufacture and distribution were concerned, the end of the war found most American industrial concerns showing serious scars incurred in the industrial phase of the war effort.

The End of the War

The first effect of the end of hostilities was a wholesale cancellation of contracts. Accountants were hurled at once into the problems of contract termination even before renegotiation of the same contracts was completed. Final disposal of inventories and of war plant facilities in many cases involved major business decisions affecting the future of the enterprise. On company-owned facilities tax laws provided for adjustment of the special amortization allowed on assets acquired for war purposes, but the amount had to be determined and claimed. There were a variety of important technical questions to be answered, all as a part of the clean-up operations called for by the end of the war.

The handling of accounting for war facilities had important cost implications for postwar business. Tax provisions encouraged complete write-off. In many cases the period of war use had resulted in writing down to low values or writing off assets which would be continued in use for peacetime production. Resulting depreciation charges would be unrealistically low and in some cases at least could result in unsound pricing of peacetime products. A few companies went as far as to restore values already written off. The majority took the opportunistic approach of taking permissible write-downs, leaving other problems to the future.*

* Accelerated Amortization Under Certificates of Non-Necessity. Research Series No. 5, *N.A.C.A. Bulletin*, Section II, June 1, 1945.

The Outlook for the Future

As this is written it is barely a year since V-J Day. A single year is far too short a period to complete the double task of clearing away the war wreckage and reconverting to normal peacetime operations. Yet final renegotiation and termination of war contracts are substantially completed. Under difficulties which will be more fully described in other papers the economy has shifted from the incredible volumes of war production to a very high level of peacetime production, but not without the emergence of new problems. These problems seem to fall into a pattern of general types. For industrial accountants the pattern shows a continuation of problems faced during the early part of the past decade, but with changed emphases.

A number of factors have combined to narrow the range of profitable operations. Costs and wages have increased substantially and are still rising. Overhead ratios have been pushed up. Higher fixed expenses raised break-even points. Prices were controlled during the war and for a year afterward. Even under control, price increases were necessarily allowed to offset increased costs, but only to an extent to reflect changes in direct costs. These increases in price have further increased costs. With volumes limited by shortages and work stoppages, the effect too often has been only to increase the customer's costs without leaving a profit to the seller. Yet there are signs that prices for some products are at, or close to, levels where consumer resistance is becoming an important factor. A few industries have reached production levels where pent-up demands, at least at current prices, have been largely met. The tempo of competition is stepping up. Already economists are talking of "a period of price adjustment" and a "recession."

All this means that cost control and cost reduction are already objectives of great importance to profitable operation and are certain to become even more important. The problem will be more difficult than before the war because of the attritional effects of war upon industrial organizations. One phase of the situation has been well expressed by a leading executive.* "The excess profits taxes have resulted in laxness in the expenditure of money and a philosophy that anything that appears desirable is justified because

* Transition Problems for the Accountant, Harry A. Bullis. *N.A.C.A. Yearbook*, 1945, p. 15.

the expenditure comes out of excess profits, most of which would go to the government anyway. This is a dangerous philosophy because it leads to undue extravagance in all phases of business. After this philosophy becomes ingrained, the habit is exceedingly difficult to eradicate." To be sure, the techniques developed during the great depression of the thirties are still available. Yet these techniques and reports built upon them will be relatively ineffectual until an underlying job of reeducation has been completed. The entire organization must learn again the importance of cost in a competitive economy and the fact that substantial cost control and reduction is accomplished in small amounts at the points where costs are incurred. Only an organization fully cognizant of this and of the reactions of different elements of costs to changing conditions of operations will realize the need of cost data as a basis for control. Such an organization will demand and use such data. Others will neither want it nor use it if it is provided.

Cost control and cost reduction problems will be faced not only in manufacturing but in distribution as well. Before the war considerable progress was made in the analysis of distribution cost, but largely in the direction of allocating costs to activities and products. The objective was data to be used in pricing and in analysis of the distribution setup. Relatively little attention was given to routine cost control and cost reduction. While great advances had been made in the determination and application of standards in the factory, only a few companies gave attention to standards for use in the distribution area. Forward-looking accountants are already concerned to do what they can to direct attention to distribution costs as a fertile field for study.

It seems certain, too, that pricing problems will be more important in the postwar period. Accountants and economists are agreed that costs do not set prices, although they are an important supply factor. As a minimum, intelligent management must know what will constitute an adequate price at various alternative volumes. This price can then be compared with what the market will permit at the same volumes. Then and only then can sound decisions be made as to whether to enter or withdraw from a market or to increase or decrease the sales emphasis given a product.

Analysis and control of distribution operations and price-making require the use of cost concepts and analytical methods which have less application to manufacturing problems. The basic data for such studies is not produced by many existing systems of cost

records. Redesign of the procedures for accumulating basic cost data will be necessary in all such cases. Standards which are to be used in price-making may require redeterminination on new bases which reflect the new use. If cost accounting is to be released from the limitations of the single purpose of inventory valuation, every policy, technique, and procedure needs reexamination in the light of the new uses to be made of the data produced.

The effect of the war period on accounting organizations has been noted earlier. Rebuilding of accounting staffs will be necessary even to restore prewar efficiencies in services offered. This will require appraisal of the human material available. Where there are weak spots, some one from within or from without the organization must be found to meet the requirements. Experience will have to be supplemented by training and education where it is inadequate for the job to be covered. Short- and longer-term plans will have to be devised to meet immediate minimum requirements and to build an organization adequate for the longer-term needs of management.

The problems of selection and training of staff go far beyond the mere remedial, however. As cost analysis has developed, it has become much more than mere record keeping. It has become an analytical tool. This tool requires expert specialist handling for its most effective use. Cost data to be effective must not only be gathered, but used. The gathering is a technical problem, but decisions as to data and analyses which are relevant and useful, and accomplishment of effective use of the data when collected, require more than technical knowledge and experience. The people who finally make cost data effective by turning it into action are the operating people, not the accountants. This means that complete cost service requires (1) a staff group sufficiently aware of operating problems to know what cost data the operating group needs and can use (2) technicians competent to collect and analyze the required data efficiently and economically, and (3) individuals trained in the design of reports which will produce action and trained in assisting operating supervisors and executives in the use of data included in such reports.

These requirements point to two needs beyond technical competence. The first is that the accounting organization shall be operation-minded. Every member of the group concerned with development of procedures and with design of reports must recog-

nize that the end-use of cost data is by operating personnel as a basis for action. He must make it his business to develop a fundamental understanding of the operating problems and data requirements of the group he serves.

The second need is that the accounting organization shall include individuals able to present cost data in terms and forms which are intelligible to operating people and able to assist these people in interpreting the data in terms of what needs to be done. Without service of this type the maximum in control and planning will be impossible, no matter how good a technical job may have been done.

These two needs point to the necessity for major efforts in building and training industrial accounting staffs. For many companies a radical shift in emphasis will be required if the cost group is to be more than a record keeping staff. Where the job is done well, cost control will become a powerful tool and the executive in charge will take his proper place as an integral part of the management group.

The new uses of cost data make effective research as to objective, policies, and procedures more necessary than ever before. Fortunately there is evidence that an aggressive attack is about to be made in this direction. The leading technical associations operating in the field are all carrying on or planning enlarged research programs. An initial report on "The Uses and Classifications of Costs," prepared and issued by the research division of the National Association of Cost Accountants, is a fundamental and significant analysis of the area to be covered.*

The literature of cost control, particularly that emanating from practitioners, is full of fundamental analyses of segment problems. With organized research working to fit the parts into a coordinated whole, as well as to examine critically the several elements, great progress should be possible. (One effect should be to make available teaching material which is necessary for effective training of young men who plan to make cost analysis their chosen area of activity.) A big job must be accomplished, and it practically all lies ahead. But a start has been made and that is a truly hopeful sign.

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* The Uses and Classifications of Costs. Research Series No. 7, *N.A.C.A. Bulletin*, Section II, May 15, 1946.

Summary

This review of accomplishments and of current problems can only be summarized as a record of progress. It is a record of a growing concept of the accounting function and of study of the management problems in which this analytical tool can make an effective contribution. Development on a broad front was temporarily halted early in the period by the onset of world-wide war conditions with their special requirements. These war years covered over half the period. The end of hostilities is still too recent for many new developments. The trends and problems are clear, however. Control and reduction of costs is of primary importance in a period when price inflation, material shortages, and industrial unrest have all worked to push costs to levels where profits are in many cases impossible and where the price structure of the nation is highly vulnerable. It is clear that success in this direction will depend not only on improved technical methods but also on building accounting organizations aware of operating problems and able to work effectively with operating personnel. Selection and training of the right people to do the work will be an important and continuing aspect of the job. Price policy and price making will continue to be of increased importance to management and cost analysis will be expected to make a greater contribution here. While distribution cost analysis has shown little progress beyond study of relative product costs, this field should attract greater attention with the problem of control and reduction of distribution costs becoming a particular object of analysis. All these problems make new demands for basic cost data which in many cases cannot become available until procedures for accumulation of basic data have been carefully reviewed in the light of the new requirements. Progress in all these directions can be expected not only from accountants faced with the practical necessities of finding solutions for part or all of the problems, but also from organized research programs which for the first time bid fair to become an important factor in the situation.

CLERICAL COST CONTROL

by H. F. VAN GORDER,
Procedure Supervisor, United States Steel Corp. of Delaware,
Pittsburgh, Pa.

DURING the course of its existence, the Procedure Division of the United States Steel Corporation of Delaware has been very successful in carrying out its responsibility for the reduction of overhead expense. Each year since its formation, it has been responsible for methods simplifications which have resulted in the savings of hundreds of thousands of dollars. But in spite of this record, of which we are duly proud, we felt dissatisfied with the basic method of operation and searched about for something which would permit the building of a firm foundation for clerical procedures.

During the few years in which I was engaged in selling office machines, I became convinced that many of the savings attributed to the installation of mechanical equipment could have been realized without the purchase of such equipment. For, in many cases, it was the ability of the salesmen to organize and plan the work, drawing upon his past experiences, rather than the machines themselves, which contributed the savings.

We therefore decided to find a definite way to measure the value of a change in itself rather than to credit a reduction in cost to the combined effect of both the machine installation and the more efficient utilization of personnel.

Clerical Cost Control Defined

The purpose of this paper is to describe the plan which was developed and is now being followed in many of the subsidiaries of the United States Steel Corporation to produce "clerical cost control," with results that have even exceeded expectations. In addition to the original objectives, we find we are achieving the following benefits:

1. The reduction of overhead through the equitable distribution of clerical workloads among available personnel.
2. Improved supervisory and managerial control through the use of scientifically established performance standards and goals.

3. The formation of a more effective procedure program, based upon a solid foundation of factual information.

In order that we may simplify the subject, may I ask that you consider this discussion in the light of the application of standard cost principles to office production. I believe the parallel will be sharply drawn as I progress.

It is not the intention to promote this plan as a cure-all for all office ills, nor is it the intention to assume credit for a startling innovation in office management. For I am sure you will agree that there is little new under the sun. What we have attempted to do is to combine the best features of many plans into one, along with some of our own modifications.

Over the years there have been many approaches to the almost universal problem of securing reasonable office efficiency and control, and reduction of clerical costs. You are familiar with most of these, such as desk studies, job loading, etc., but in many instances the installation of controls caused so much confusion and inefficiency that the controls were soon discarded, as neither the supervisor nor the employees were in sympathy with the installation. Then, too, frequently the system did not contain, as an integral part, a self-perpetuating check as to performance after installation. The clerical cost control program is a supervisory tool for getting a fair day's work for a fair day's pay. Through the use of the monthly clerical budget, the benefits of clerical cost control are perpetuated, since attendance hours are measured against standard hours for the current volume, and the efficiency of performance is reflected. Budgets predicated largely on past performance do not provide a satisfactory means of controlling clerical cost. They tend to reflect what the costs have been, rather than what the costs should be.

In itself, the plan, we feel, is the best we could devise for the measurement of clerical output. However, I wish to stress that the philosophy behind its development or use is of more importance than any method created for its accomplishment. This need for control of clerical costs is obvious. It is just as necessary as the control of production costs. Clerical costs can be controlled on any routine, repetitive work. A clerical cost control program supplies the answers to such vital questions as:

1. What is a proper standard of performance?
2. What is a fair day's work for a fair day's pay?

3. What is an adequate method for loading jobs on the basis of a fair day's work?
4. How are force requirements determined and maintained so as to recognize changes in the volume of work load?

Importance of Flow Charts

The reader probably is familiar with the various methods of diagraming or flow-charting which have been developed since the publication of "Flow Process Charts," by F. B. and L. M. Gilbreth in 1921.* In our method we have attempted to simplify, to the greatest extent possible, the recording and presentation of the facts. This program makes use of the procedure flow charts, time standards, and monthly budgets in order to accomplish maximum savings. In order that we may clearly understand a problem and arrive at a reasonable and practical answer, it is first necessary that we be fully acquainted with that problem in detail. To that end many of our companies are now engaged in charting all clerical functions by this method. The examples used in the following discussion are typical, and taken from an actual survey. However, all exhibits have been simplified and condensed to assist in ease of presentation.

Scope of the Survey

The scope of the survey should be determined at the outset. For the immediate purpose at hand, that of the establishment of clerical budgets, we believe it best to study all functions of an established responsibility, or recognized division thereof. As an example, we would confine a single study to the payroll bureau at a given location rather than cover the entire payroll procedure. For this reason, the scope is usually considered to be that of a complete responsibility, and an organization chart is prepared as the initial step. This chart, Exhibit 1, for an invoice bureau, contains only position titles, the number of persons assigned to the position, the line of authority, and an arbitrary position number. You will observe that no position number is assigned to the invoice bureau chief. This position is supervisory in nature and not included in this survey. Employee names are not used since individuals are not considered in a survey of this type. Time standards are set on the basis of an average employee without regard to the individual performing the duty.

* Paper No. 1818, American Society of Mechanical Engineers.

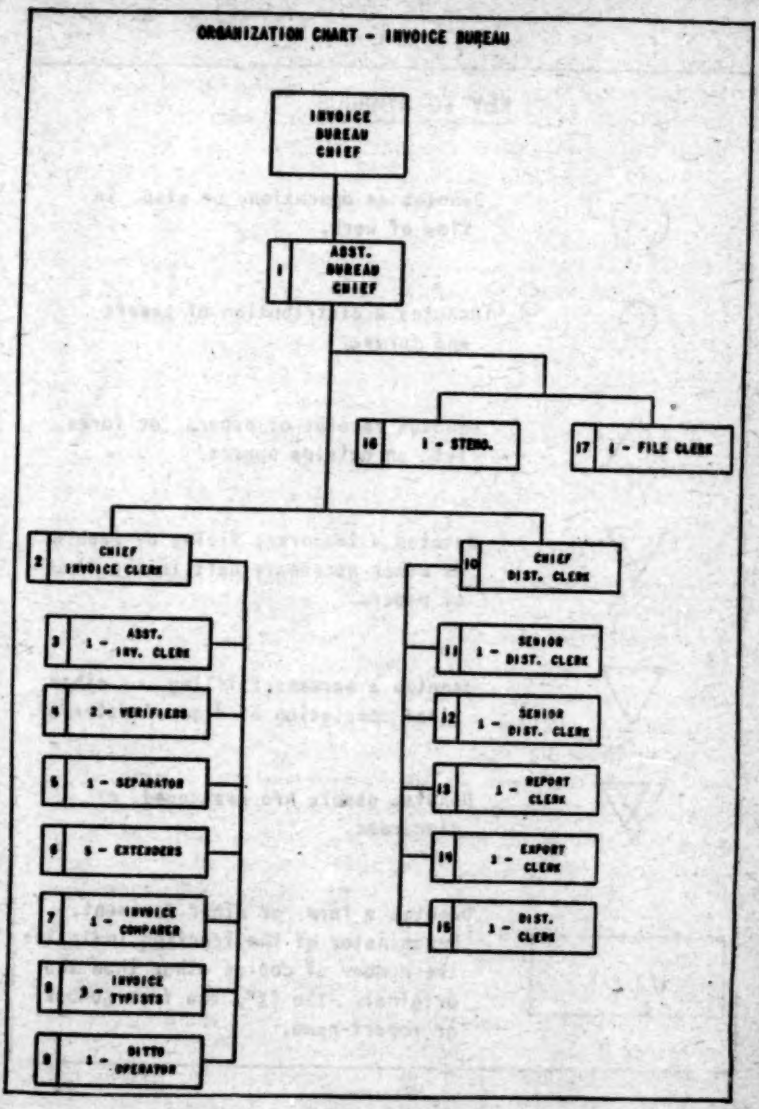
ORGANIZATION CHART - INVOICE BUREAU
INVOICE BUREAU CHIEF
1 ASST. BUREAU CHIEF
16 1 - STENO.
17 1 - FILE CLERK
2 CHIEF INVOICE CLERK
3 1 - ASST. INV. CLERK
4 2 - VERIFIERS
5 1 - SEPARATOR
6 5 - EXTENDERS
7 1 - INVOICE COMPARER
8 3 - INVOICE TYPISTS
9 1 - DITTO OPERATOR
10 CHIEF DIST. CLERK
11 1 - SENIOR DIST. CLERK
12 1 - SENIOR DIST. CLERK
13 1 - REPORT CLERK
14 1 - EXPORT CLERK
15 1 - DIST. CLERK

EXHIBIT 1

KEY TO SYMBOLS

Denotes an operation, or step, in flow of work.

Denotes a distribution of papers and forms.

Denotes receipt of papers, or forms, from an outside source.

Denotes a temporary filing of papers, or other necessary halt in the flow of papers.

Denotes a permanent filing, or other final completion of flow of material.

Denotes papers are destroyed, or discarded.

1/3 - X

Denotes a form, or other document. Denominator of the fraction indicates the number of copies other than the original. The "X", the form number or report name.

EXHIBIT 2

Symbols and Arrangement

Exhibit 2 shows the symbols which we ordinarily use. A much wider range of symbols is available, but we have found it unnecessary to use them. You will recognize these symbols as being widely used for charting the flow of materials in manufacturing operations, and their meaning is generally understood.

We recommend that the flow charts be drawn on continuous rolls of tracing paper. This permits economical duplication of finished charts. Column arrangement should allow a vertical space for each major unit or section of the department to be studied. The first column on the left ordinarily depicts the section responsible for the starting operations and the succeeding columns to the right, the duties of subsequent groups. This practice emphasizes any "back flow" in work sequence.

Exhibit 4 illustrates the columnar classification of functions. The column "Non-Section Personnel" is used for charting the duties of the assistant bureau chief, stenographer, and file clerk, since these positions are not in either of the major subsections. (See Exhibit 1). A miscellaneous column is provided on the right side for outside organizations or groups having a secondary part in the work flow. This segregation of responsibilities is particularly helpful in the reallocation of duties. Operation breakdown is of major importance, and each individual step should be shown in the greatest detail practicable. If a number of steps are grouped into a single operation instead of being charted in sequence, the effect may well be a distortion of the standards ultimately assigned. In determining operation breakdowns, the analyst should also consider the possibility of charting the same operations at other locations. If care is exercised in anticipating similarities, it will be possible to avoid complete recharting since exceptions can be noted on a copy of the original chart.

Operation Descriptions

Operation descriptions appearing beside the chart symbols must fully explain the work performed. Brevity is desirable, but not at the expense of a full statement of the operation. It should be remembered that the descriptions will be used to estimate clerical time requirements and that they should provide a basis for accurately assessing job content. In addition, they will eventually be used as individual position descriptions, and then the descrip-

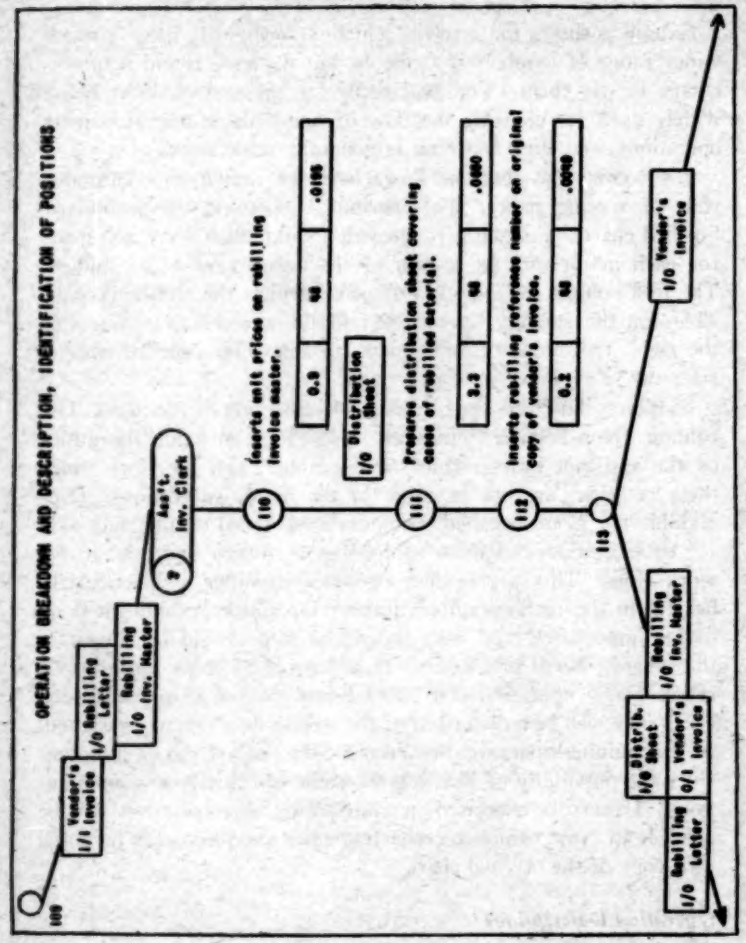

EXHIBIT 3

tions of the other operations may not be available to aid in clarifying an ambiguous statement. The subsequent analysis of operation times will be facilitated if each operation is followed by three joined rectangular spaces for recording: (1) man-hours per month, (2) monthly volume, and (3) man-hours per unit.

Identification

Identification of the position performing the operation is of major importance since this is the key to the preparation of position descriptions. You will note that on Exhibit 3, the "circle within the oval" carries the same position number and title as is shown on the organization chart (Exhibit 1). Personal names are to be avoided since turnover and transfers will make the material obsolete. Identification of forms or reports is accomplished by the rectangular symbol shown in Exhibit 2. The name or form number is inserted in the rectangle preceded by the fraction which indicates the original by the numerator and the number of copies by the denominator. This practice easily identifies the original throughout the flow. If it is necessary to identify individual copies, this can be done by indicating the copy number in parentheses after the form name.

The applicable form should be recorded opposite the operation symbol, whether it is to be prepared or received from an outside source, and it should appear on every sloping line to other responsibilities as illustrated in Exhibit 3. Finally, it should appear beside each "file" or "destroy" symbol. If the chart is properly drawn, it should be possible to balance the number of forms or reports received or originated against the number filed, destroyed, or sent to an outside responsibility.

In order to develop a complete file for subsequent study, the analyst should secure copies of all forms and papers mentioned in the chart. Typical filled-in copies are recommended, since the appearance of a form does not necessarily indicate the full application which has developed for it over a period of time.

Flow Lines

Flow between responsibilities is indicated by sloping lines on the underside of the small circle used to denote a distribution of papers. A slope of approximately 7½ degrees is used since multiples of this figure are convenient when copies are sent simultaneously to a number of points. Moreover, a uniformity of slope produces a better appearance. Flow lines should never slope upward because of the confusing effect on the chart reader. Exhibit 4 illustrates the flow of work from one clerk to another, and between responsibilities. Crossing of flow lines should be avoided whenever possible. However, when the layout of the chart necessitates

EXHIBIT 3

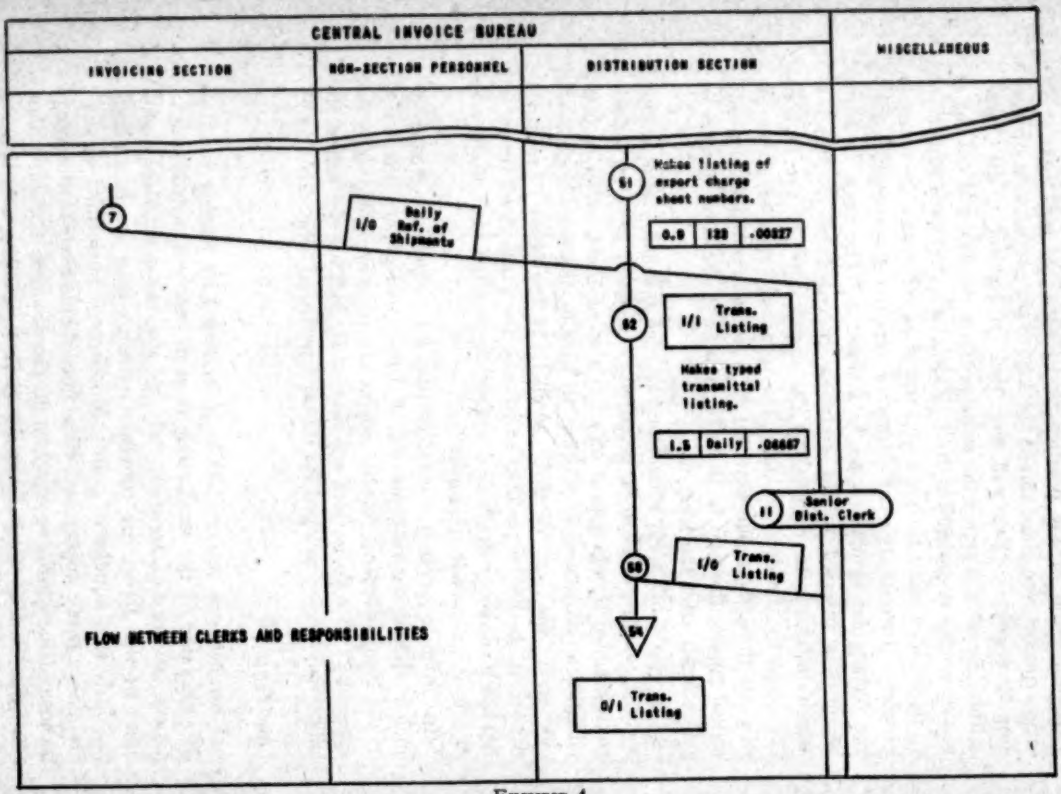
CENTRAL INVOICE BUREAU
INVOICING SECTION
NON-SECTION PERSONNEL
DISTRIBUTION SECTION
MISCELLANEOUS
S1
Makes listing of export charge sheet numbers.
0.9
133
.00827
7
I/O
Daily Ref. of Shipments
S2
I/I
Trans. Listing
Makes typed transmittal listing.
1.5
Daily
.06667
11
Senior Dist. Clerk
S6
I/O
Trans. Listing
S4
O/I
Trans. Listing
FLOW BETWEEN CLERKS AND RESPONSIBILITIES

EXHIBIT 4

crossing, one line should be looped over the other (as in an electrical circuit diagram) to indicate that "no connection" exists.

Alternative methods are shown on the chart by means of a "rake" which depicts on separate vertical lines the sequence of operations in each instance. Such a "rake" may have as many vertical lines as the circumstance requires, and they will be joined with the main flow again when the exceptions are resolved and all operations resume a common sequence. For example, the invoices being processed in Exhibit 5 are divided into three groups, as different handling is required for each. After these special functional processes are completed, the invoices flow back into the main stream of work. The use of the rake is vital in preparing a complete flow picture. It aids the analyst in developing an accurate chart even though his knowledge of the procedure may be limited. A simple example would be that of a checking or verification operation as in Exhibit 5, operation 11. Each of these must be followed by a rake showing "OK" or "NG" operation sequences.

EXHIBIT 4

Work Load

The success of the entire clerical cost control program rests on the accuracy of data shown in the rectangles for the recording of total man-hours per month, total monthly volume, and man-hours per unit. As shown in Exhibit 6, the three rectangles are drawn side by side for each operation. The left rectangle is for total man-hours per month, the center one for the number of units, and the right-hand one for the time per unit. Monthly work volume of each operation must be determined and entered in the spaces provided on the chart after each symbol. Care should be exercised in selecting the unit of measurement (number of invoices per month, payroll names, etc.) most applicable to each operation. In addition, in order to minimize the number of determinants used, it is desirable to select units of measurement commonly applicable to as many operations as possible.

Having decided on the measurement basis, the average monthly volume of the most recent representative period is determined. In this connection, it is desirable to recognize that the same volume figures may be used in a series of departments, and that it is desirable to check them for consistency and common "break-off" points.

The determintion of operation unit times is the key to effective work assignment and measurement. Because it is based on per-

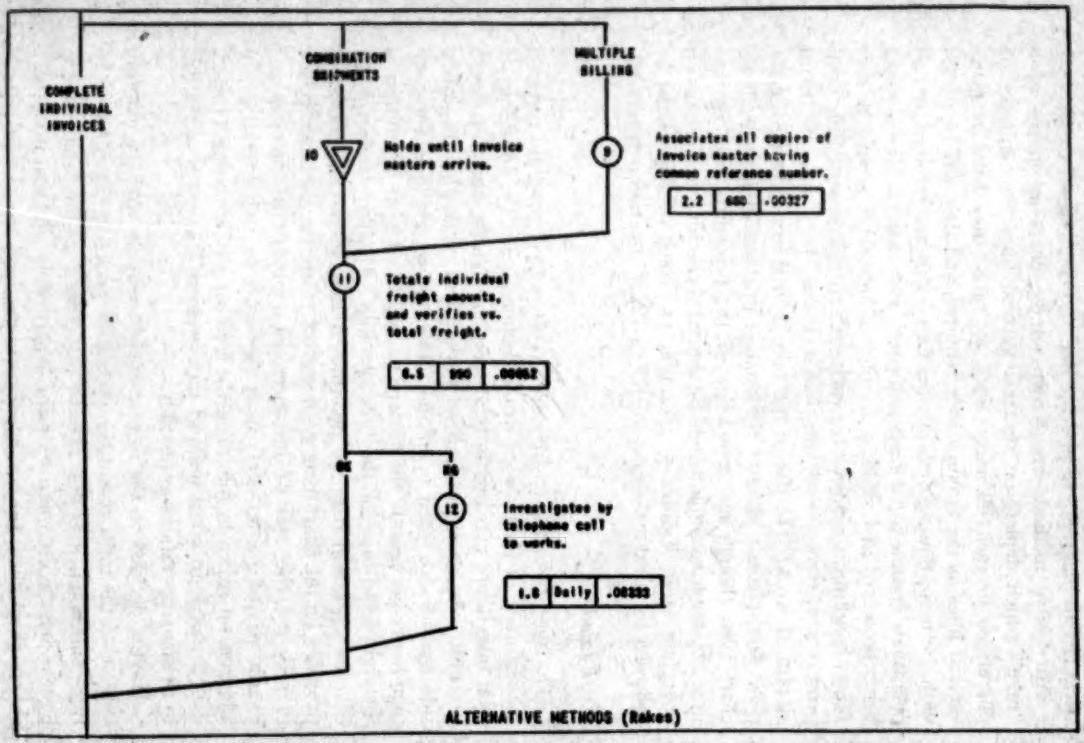
COMPLETE INDIVIDUAL INVOICES
CONSERATION SHIPMENTS
MULTIPLE BILLING
10
Holds until invoice masters arrive.
9
Associates all copies of invoice master having common reference number.
2.2
680
.00327
11
Totals individual freight amounts, and verifies vs. total freight.
6.5
990
.00652
OK
RG
12
Investigates by telephone call to works.
1.8
Daily
.00333
ALTERNATIVE METHODS (Rakes)

EXHIBIT 5

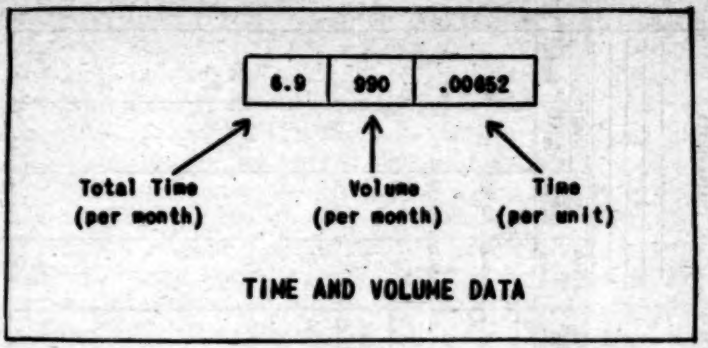

EXHIBIT 6

sonal judgment, it is not possible to outline specific rules which will produce successful results. It is necessary for the analyst to apply the fundamental principles underlying this technique. The most important feature is continuous recognition of the fact that successful application of time estimates depends to a large degree upon the fact that inaccuracies in time estimates tend to offset each other. A tendency toward excessively liberal estimates will produce exaggerated total figures, particularly when large volumes are concerned. The effect is to accumulate rather than to offset inaccuracies. The unit time values are usually based upon agreement between the analyst and persons directly familiar with the operations. Every effort should be made to determine a fair time for a single performance of the particular operation, excluding all allowances for rest, personal needs, etc., since they will include unnecessary delay time. If the operation breakdown in the chart is fine enough, the individual unit time estimates will be smaller and more numerous, thus enhancing the compensating effect of minor inaccuracies.

It will be found that time estimates are made usually in terms of minutes or seconds. For the convenience of later calculations, it is advisable to use a conversion table and to record the times in the appropriate spaces on the chart in terms of decimal hours. Each unit time figure is then extended by the appropriate volume and the resulting man-hours per month for each particular operation is entered on the chart.

Special attention should be given to single operations which constitute a major portion of a job, since an inaccuracy in the estimate

EXHIBIT 5

PROCEDURE POSITION DESCRIPTION

SIGNATURES

COMPANY - U. S. Steel Subsidiary
LOCATION - General Office
RESPONSIBILITY - Accounting
SECTION - Invoice Bureau
POSITION - Stenographer (1)

SURVEY DATE -
ANALYSIS DATE -
REVISION DATE -
REVISION DATE -
REVISION DATE -

CHART NO.	OPER. NO.	OPERATION DESCRIPTION	PER CENT OF MONTHLY TIME	MAN HOURS PER MONTH	AVERAGE UNITS PER MONTH	MAN HOURS PER UNIT	ADJUSTED BASIS M.H. PER UNIT	ADJUSTED BASIS M.H. PER MONTH
		Balance Forwarded	30.2	51.1				
I	28	Prepares Report of Fabricated-in-Transit Material.	0.1	0.1	Monthly	.08333		
	29	Prepares Letter to Accounts Payable Bureau - Products Shipped Adjustment Account.	0.1	0.1	Monthly	.08333		
	30	Maintains Correspondence and Report Files.	4.2	7.3	Daily	.33333		
		Total Effective and Allowance Time	34.6	58.6				
		Reserve Time	65.4	114.4				
		Total Available Man-Hours Per Month	100.0	173.0				

LAST PAGE OF POSITION DESCRIPTION BEFORE RELOADING

EXHIBIT 7

can cause a serious distortion in the final figures. For example, consider a group of 10 billing machine operators whose monthly attendance time amounts to 1730 man-hours. If it is estimated that 15 seconds are required for each line billed, a volume of 300,000 items per month would require 1260 man-hours, or 73 per cent of the available time, exclusive of all other operations included in the job. If the estimate had been 13 seconds, the volume would have required only 1080 man-hours, or one person less. Obviously if conditions permit, it is desirable to treat a condition of this kind with regular stop-watch technique. However, such instances are not too frequent and the recommended estimating technique will usually be found adequate.

Allowances

An allowance factor must be used to increase unit time estimates to adjust for loss of productivity due to fatigue, rest periods, acceleration, deceleration, etc. However, certain types of operations are not suited to volume measurement since they represent fixed daily, weekly, or monthly occurrences. Flat time allowances should be allowed in these instances, and no allowance factor should be applied. Pending increased experience with the fatigue of clerical workers, the present policy is to divide each worker day of 8 hours as follows:

6 hours—Regularly assigned routine work
1 hour —Reserve for peak loads, special assignments, etc.
1 hour —Allowance time

8 hours—Total attendance time

Based on this policy, each unit time estimate is increased by 16 2/3 per cent in order that the one-hour allowance time may be spread over all operations. Then at the optimum loading of each position —as near 87½ per cent of available time as possible—the effect is to allow the desired one hour per day.

You will notice that by design the flow chart does not provide a summarized picture of a single position. It thus becomes necessary to prepare a position description for each position as found in the original study. When such a summary is completed, as illustrated in Exhibit 7, the amount of unused reserve time becomes apparent.

EXHIBIT 7

PROCEDURE POSITION DESCRIPTION

SIGNATURES

COMPANY - U. S. Steel Subsidiary
LOCATION - General Office
RESPONSIBILITY - Accounting
SECTION - Invoice Bureau
POSITION - Stenographer - File Clerk (1)

SURVEY DATE -
ANALYSIS DATE -
REVISION DATE -
REVISION DATE -
REVISION DATE -

CHART NO.	OPER. NO.	OPERATION DESCRIPTION	PER CENT OF MONTHLY TIME	MAN HOURS PER MONTH	AVERAGE UNITS PER MONTH	MAN HOURS PER UNIT	ADJUSTED BASIS M.H. PER UNIT	ADJUSTED BASIS M.H. PER MONTH
		Balance Forwarded	70.1	121.6				
I	28	Prepares Report of Fabricated-in-Transit Material.	0.1	0.1	Monthly	.08333		
	29	Prepares Letter to Accounts Payable Bureau - Products Shipped Adjustment Account.	0.1	0.1	Monthly	.08333	From Steno's Position	
	30	Maintains Correspondence and Report Files.	4.2	7.3	Daily	.33333		
	34	Attaches Correspondence to related charge sheets for filing.	1.2	2.0	200	.00972	From File Clerk's Position	
	35	Files Charge Sheets in letter folder in numerical order.	6.1	10.5	8109	.00130		
		Total Effective and Allowance Time	81.8	141.6				
		Reserve Time	18.2	31.4				
		Total Available Man-Hours Per Month	100.0	173.0				

CALCULATION OF CLERICAL BUDGET STANDARDS

Filing of Daily Charge Sheets : $\frac{74.4 \text{ Man-Hours}}{8109 \text{ Charge Sheets}}$ = 0.00917

Filing of Daily Credit Memoranda : $\frac{43.7 \text{ Man-Hours}}{1200 \text{ Credit Memos}}$ = 0.03625

Constant Time (Miscellaneous Filing and Preparing Reports) = 23.5 Man-Hours Per Month

LAST PAGE OF POSITION DESCRIPTION AFTER RELOADING

EXHIBIT 8

Reducing the Overhead

The next step is one of extreme importance for it is the one by which overhead is reduced. Effective position loading should be the objective of each survey. Having determined volume statistics and time values on every operation, the analyst should use the survey data to relate the clerical positions to the recorded facts and work load. The following fundamentals should be considered in each instance:

1. Eliminate all duplication, unnecessary operations, etc.
2. Do not mix skill grades in any single position. The only exception to this would be in the small office where it would be impractical to attempt to avoid it.
3. Assign duties so as to assure a continuous and forward flow of material through the various positions to avoid bottlenecks and back-tracking.
4. Load to approximately 87½ per cent (after proper time allowances) leaving 12½ per cent for handling peak loads and special tasks.
5. Consider supervisory positions from the viewpoint of specialized responsibility, effective span, and minimum costs.

Exhibit 8 is the last page of a reloaded job, the same job as shown in Exhibit 7 before reloading. In this case, the stenographic work has been combined with that of the file clerk in order to make more effective use of reserve time. Budgetary control of clerical man-hours is absolutely necessary to assure a continuous management control which will perpetuate the benefits resulting from the survey. This budget can be accomplished by determining standard unit times for each newly established position. The lower half of Exhibit 8 is an illustration of the calculation of man-hour budget standards for the position of stenographer-file clerk. The total hours expended on each principal function is divided by the volume found by the survey to be representative. "Constant" time is allowed for that work and will tend to remain unchanged, from the standpoint of man-hours required, regardless of fluctuations in volume.

A standard of this sort should be established for each position. Where responsibilities are mixed, two or more determinants and resultant standards may be desirable for each position. These standards will provide a basis for:

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

MONTHLY BUDGET OF CLERICAL MAN-HOURS

General Office - Invoice Bureau | Accounting Responsibility | Date

POSITION AND FUNCTION	BASIS OF MEASUREMENT	STANDARD UNIT TIME	MONTHLY VOLUME	STANDARD MAN HOURS	ACTUAL MAN HOURS	OVER OR UNDER STANDARD	% OF EFFIC.
ASSISTANT BUREAU CHIEF							
Reviews Claims and Prices	Number Claims and Price Adjust.	0.19700	164	32.3			
Prepares Miscellaneous Invoices	Number of Invoices	0.16480	277	51.2			
Miscellaneous	Constant			64.5			
Special Assignment	Actual						
Sub-Totals				148.0	165.0	17.0	89.7
CHIEF INVOICE CLERK							
Review Bills of Lading	Bills of Lading		3744	18.9			
STENOGRAPHER - FILE CLERK							
File Daily Charge Sheets	Number of Charge Sheets	0.00917	8340	76.5			
File Daily Credit Memos	Number of Credit Memos	0.00365	1150	23.5			
Miscellaneous	Constant			42.0			
Special Assignments							
Sub-Totals				142.0	173.0	31.0	82.1
GRAND TOTALS				2847.1	3629.0	781.9	78.5

Italics denote red figures.

EXHIBIT 9

1. Estimating volume and clerical requirements at the start of a period and the utilization of excessive reserve time for special assignments or reduction in force.
2. The determination of performance measurement by comparison of actual with standard. (See Exhibit 9)
3. The development, by the application of payroll data, of dollar variances due to performance; hours paid for but not worked, volume variance, etc.

Conclusion

The effectiveness of this entire technique is dependent upon the completeness of the procedure flow charts drawn in the initial survey. This is of major importance since faulty results will be obtained from inadequate source data. In addition, the charts are used as permanent records of the procedures involved, and they should be complete and fully understandable at all times, not only by the analyst who drew them, but by anyone who refers to them. They should always answer the who, what, when, where, and how.

COMING ARTICLES

In the *N.A.C.A. Bulletin*, October 1, 1947

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